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Utilizing the High Altitude Airspace

Within U.S. Army Space and Missile Defense Command/Army Forces Strategic Command, we focus daily upon providing space enablers to the Warfighter. Within the pages of the Army Space Journal, we've touched many times upon the subject of space enablers (Communications; Position, velocity, and timing; Environmental monitoring (space and terrestrial weather); Intelligence, surveillance, and reconnaissance; and Theater missile warning). We've also discussed in detail, our space and terrestrial based capabilities for providing and/or supporting these vital mission areas.

During the course of our discussions, we often overlook 265,000 feet of airspace (60,000 feet to 325,000 feet) that holds great potential for providing enduring support directly to the Warfighter. This area is called high altitude. It's an area of operations spanning from just above the ceiling of most aircraft to just below near earth orbit. USASMDC/ARSTRAT is the Army's proponent for high altitude, and we've been actively seeking methods of exploiting this area of operation for almost a decade.

Since the 2010 Winter edition of the Army Space Journal focuses on the space Warrior METL (Mission Essential Task List), I think it appropriate to include a discussion about our high altitude activities and how those activities add additional arrows in the space Warrior's quiver. This article provides the background and purpose behind our interest in near earth activities. It also provides an update on the systems we're working on.

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“We often overlook 265,000 feet of airspace (60,000 feet to 325,000 feet) that holds great potential for providing enduring support directly to the Warfighter. This area is called high altitude.”

Background

Nothing in the Army moves or shoots without a regulation to direct it, and USASMDC/ARSTRAT is no different. On Sept. 4, 2007, Army Regulation 10-87, made USASMDC the Army specified proponent for High Altitude. There is no established Service lead for High Altitude within the Department of Defense.

Appointment as the proponent for High Altitude capped approximately four years of work by members of the Future Warfare Center and the Technology Center in this arena. It also gave the Command the authority to execute the proponent mission within the Army. Outside of the Army, we engage the other Services through the Joint High Altitude Council (Memorandum of Agreement signed Nov 2005). The Joint High Altitude Council meets semi-annually, and serves as a forum for the Services to update each other regarding their development activities in High Altitude.

Within the Command, we've actively pursued three primary lines of effort: Experimentation, Documentation and Requirements, and Technology Development.

Experimentation

Since 2003, the Future Warfare Center Battle Lab has been at the forefront of High Altitude concepts and capabilities within the Army and Joint Experimentation. The Army conducts experimentation as part of its “Campaign of Learning” in order to enable informed decisions, improve the combat effectiveness of the current and future force, and mitigate risk and cost. High Altitude has been represented in experimentation events every year since 2003. These events include ... Omni Fusion, Schriever Space War-game, Unified Quest, Unified Endeavor,

Earth, Wind, and Fire, Urban Resolve and the Digital Warfighter Experiment. At the conclusion of each event is an assessment of the value-added that High Altitude brings to mission success. These lessons serve as the basis for the next round of experimentation. Experimentation results have consistently pointed toward value added of High Altitude assets in providing persistent wide area surveillance, battle damage assessment, and enhanced communications.

These capabilities are vital to the Warfighter on the ground. Persistent – weeks to months – of continuous coverage, providing space enablers to the Soldier at the tip of the spear is of vital importance to the Warfighter. Determining the best use of High Altitude requires documentation of not only the capabilities provided by its systems and how they support Army concepts, but most importantly, the requirements of the Warfighter so that High Altitude systems can be assessed against the stated needs of the end user – the Soldier on the ground.

Documentation and Requirements

The Future Warfare Center Battle Lab is actively working to include High Altitude into Army concepts. We use our input to these documents to articulate the role that High Altitude plays in support of Army warfighting functions. We've also worked to develop documentation that validates the ability of High Altitude to meet the stated needs of the Warfighter.

The High Altitude Enable Capabilities Assessment was completed in August 2009. This document assesses High Altitude enabled capabilities to determine their ability to provide viable solutions for mitigating Army gaps and satisfying Army requirements. “Findings from this assessment, and supported by other Army study and analytical efforts, are conclusive.

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Significant capability gaps exist now and will continue to exist beyond the current out-year funding for assured communications and persistent surveillance and reconnaissance. The High Altitude Enable Capabilities Assessment definitively finds that High Altitude capabilities, once developed, could play a significant role in mitigating those gaps and thus play a decisive role in mission success by enabling:

- Continuous, robust secure communications supporting Command, Control, Communications Computers, Intelligence, Surveillance and Reconnaissance for both static and on-the-move operations in complex terrain
- Network extension and expansion to widely-dispersed/isolated/ disadvantaged units
- Continuous and near real-time battle damage assessment information
- Sensor to shooter to support deep fire strikes at extended ranges
- Persistent, wide-area surveillance supporting Operational and Tactical Maneuver
- Greater communications coverage with fewer platforms and less force structure than lower altitude, shorter endurance platforms
- Capability provided under adversary threat and weather conditions that programs of record platforms cannot provide
- Improved Situational Awareness of the Commander's operational and tactical area of interest (including lower probability of Friendly Force fratricide)
- Lower attrition of Unmanned Aircraft System assets supporting surveillance and reconnaissance and communications functions
- Reapportionment of Unmanned Aircraft System assets to higher-priority missions
- Expanded and improved communications, surveillance and reconnaissance capabilities in support of Fires planning and execution"¹

We are in the process of completing the High Altitude Functional Solutions Analysis. This Analysis looks at materiel and non-materiel solutions to the gaps identified in the High

Altitude Enable Capabilities Assessment. Emerging results from the Functional Solutions Analysis indicate that it will recommend that a materiel solution is required to mitigate the remaining gaps in Army capabilities and that emerging High Altitude systems should be a part of that materiel solution. The draft should be out for coordination by the end of February 2010.

Technology Development

USASMDC/ARSTRAT began its association with High Altitude during our participation in the original High Altitude Airship technology demonstration in 2003. Our Technology Center was the Technical Manager and our Future Warfare Center Battle Lab was the Operational Manager. The Technology Center leads our technology development efforts; especially in regard to developing lighter than air station-keeping airships. High Altitude technology efforts have included the original High Altitude Airship, High Altitude Long Endurance – Demonstrator, HiSentinel, and heavier than air initiatives; Zephyr, Global Observer, and Orion.

As High Altitude technology is developed, our Future Warfare Center Battle Lab, serving as our Operational Manager, works to mature and demonstrate it to the Army and the Warfighter. We currently have a testing flight/demonstration for the Global Observer scheduled for the second quarter of Fiscal Year 2010. HiSentinel 80 and High Altitude Long Endurance - Demonstrator will also fly in the second or third quarter of Fiscal Year 2010. In the next issue of Army Space Journal, I will write about the programs underway, including the Long Endurance Multi-Intelligence Vehicle.

Conclusion

What does all of this mean for you, the space professional? It means High Altitude is moving closer and closer to operational reality. The Army recognizes the need for and the application of High Altitude to meet the Warfighter's operational requirements. As we discuss the Mission Essential Task List for various space and ground based systems, we may want to start factoring in High Altitude. The Army through USASMDC/ARSTRAT currently has the greatest breadth of High Altitude activities across Doctrine, Operations, Training, Materiel, Leadership Development, Personnel and Facilities of any Service. I fully expect we'll be at the forefront of any operational deployment.

Footnotes

¹High Altitude Enabled Capabilities Assessment, pp 5-6